

this catalogue is the class of fishes—out of a total of 249 recorded British species, only 148 are known to occur in the county and the sea that washes its coast. Eighty species of marine fishes which occur somewhere in the British seas are unknown on the Yorkshire coast; some of these will probably turn up hereafter; many of them are scarce fishes, which have occurred only once or twice anywhere round our coasts, or species of southern type which can hardly be expected to find their way so far north.

On the whole, Yorkshire has good reason to be proud of its vertebrate fauna; and the authors of this catalogue may with equal justice take a pride in their work, which has evidently been executed with most conscientious care. As already stated, it includes the whole British vertebrate fauna; and the Yorkshire species are indicated by having appended to their names brief statements relating to their occurrence in the county, including the localities where specimens have been obtained in the case of the rarer species, and frequently an indication of the museums in which known Yorkshire specimens are preserved. The authors have given a short introductory exposition of the principles by which they have been guided in the performance of their task, followed by an excellent brief sketch of the physical aspects of Yorkshire, and a summary of the results of their investigation of its Vertebrata. The little book is a most valuable contribution to British zoological literature; and the authors could not have paid a more graceful compliment to the British Association in its year of jubilee than by dedicating it, as they have done, to Sir John Lubbock, as President of the Association at the York meeting.

MISCELLANEOUS.

On the Origin of the Ovum in the Hydroids.

By M. A. DE VARENNE.

UNTIL lately it was supposed that the ova and spermatozooids of the Hydroids are developed in the interior of the gonophores, medusoid buds, and Medusæ; and, in fact, these individuals are regarded as representing the sexual generations of these animals. Various opinions even have been put forward with regard to the endodermic or ectodermic origin of the sexual elements in these gonophores. M. Goette, however, in a memoir on *Hydrella*, published in 1880, showed that, in that species, the ova attain their complete development in the stem instead of being conveyed into a gonophore; and in the same year M. Weismann observed that, in *Plumularia echinulata*, the sexual elements are developed in the stem and afterwards pass into the gonophore; and he has recently demonstrated the same fact with regard to the ova in the genus *Eudendrium*.

Simultaneously with these two authors, but without any knowledge of their labours, I busied myself with the same question last summer at the laboratory at Roscoff; and the following are the results to which my observations have led me.

In *Campanularia flexuosa* the ova are met with in the endoderm
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of the stem before the appearance of any gonophores ; they are true endodermic cells differentiated ; and we find all the transitions between an ordinary endodermic cell and a well-developed ovum. They are conveyed, with the neighbouring endoderm and ectoderm, into the gonophore which is in course of development, and which is at first only a simple diverticulum of the body-wall of the Hydroid polype.

In a variety of *Plumularia echinulata* that I found at Roscoff I observed the same phenomena : the stem is filled with ova before the appearance of the gonophores ; then the perisarc is perforated at a certain point in the stem where a gonophore is to be developed ; the endoderm and ectoderm of the stem form, as it were, a hernia through this fissure, and carry the ova along with them as they advance. A new chitinous envelope is secreted, and we get a young gonophore, in which the ova complete their development. My observations upon *Sertularia pumila* have led me to the same results.

Thus in these three species, which have their sexual generation represented by gonophores which always remain attached to the Hydroid polype, I was last year led to conclude that the ova are developed, not in the gonophore as was supposed, but in the actual stem of the polype itself, which has been regarded as the asexual generation.

This year I wished to profit by my sojourn at the Laboratory at Roscoff, in order to extend my observations to the species which have not gonophores fixed through their whole life, but free Medusæ.

I commenced with a species which has semimedusæ (that is to say, a gonophore with an umbrella, tentacles, and well-developed canals, but which remains constantly attached to the polype upon which it buds), namely *Gonothyræa Loveni*. Here, again, the ova originated from the endodermic cells of the differentiated stem ; they are carried away with the neighbouring tissues into the blastostyle and the gonophore, to the interior of the gonangium, and they complete their development in the semimedusæ which are met with at the summit and exterior of the female capsules.

To study what takes place in the species of which the sexual generation is represented by free medusæ, I selected *Podocoryne carnea*, which lives parasitically upon the shells of *Nassa*, and *Obelia geniculata*. The former belongs to the Tubularian and the second to the Campanularian group.

In the region of the body of the Hydroid polype upon which the Medusæ are to bud we find ova in course of development. They are modified cells of the endoderm. When the Medusæ begin to bud they are at first only a simple diverticulum of the two layers which form the wall of the body of the polype ; the ova are carried into the interior of this young bud : they are then much smaller than in the species cited above ; but from this moment they are rapidly developed ; soon the peduncle of the medusa ruptures, it separates from the Hydroid polype upon which it has budded, swims about freely, and completes its metamorphoses, while, at the same time, the ova it contains attain maturity.

We are thus led to conclude—

1. That in the species above cited, which have their sexual generation represented by gonophores always attached to the hydroid polype, or by semimedusæ or free medusæ, the ova originate in the interior of the hydroid polype itself, and not in these gonophores or medusæ.

2. That the ova are only differentiated cells of the endoderm, and that we can observe all the transitions between an ordinary endodermic cell and a well-developed ovum.

3. That the ova are conveyed into a bud, which is at first only a diverticulum of the body-walls of the polype; that this bud enlarges, and finally becomes a gonophore, destined to be always attached, or a semimedusa or a free medusa.

4. If we accept as demonstrated the facts that I have just expounded, the gonophores, the semimedusæ, and the medusæ cannot be regarded as sexual individuals; consequently it would seem that alternation of generations cannot be accepted for these species.—*Comptes Rendus*, August 16, 1881, p. 345.

*Biological Evolution of the Aphis of the Alder** (*Vacuna alni*, Schrank). By M. J. LICHTENSTEIN.

Among the Aphidians there exists a small group of insects which is distinguished from all the rest at the first glance by the mode of carrying the wings. Instead of being roof-like, as is the rule, these organs are laid flat upon the back, as in the males of the Coccidæ.

Of these the *Phylloxera* is the best known type. I have already, some ten years ago, traced the evolutive cycle of this genus, showing the *Phylloxera* of the oak with two apterous and two winged forms, the *Phylloxera* of the vine with three apterous and a single winged form, and the *Phylloxera acanthohermes*, which is always apterous.

Besides the genus *Phylloxera*, which has only three joints in the antennæ, only two other genera carry their wings horizontally, namely *Aploneura*, with six joints in the antennæ, and *Vacuna*, with five joints in the antennæ.

Only one species of *Aploneura* was known, namely the *Aphis* of the pistachio (*A. lentisci*); I discovered its sexual forms in a second on the roots of grasses. I regard this second species as a form of that of the pistachio, believing that there is a migration from the pistachio to the grasses, as also in that of the *Phylloxera* from the white oak to the green oak, and *vice versâ*.

It remained to study the *Vacunæ*, of which two species are known—*V. dryophila* on the oak and *V. alni* on the alder and birch.

Vacuna dryophila lives on the green oak and the white oak; and I have hitherto been unable to ascertain any regular migration; but, at any rate, in December, a winged form appears under the leaves of the white oak (*Quercus pubescens*), and there deposits sexual

* There is also upon the alder another *Aphis* (*Aphis alni* of Kaltenschach, Koch, &c.) which is a true *Aphis* with seven joints in the antennæ, and has been placed by Passerini in the new genus *Pterocallis*. I only intend here to examine the *Aphis* with flat wings, allied to *Phylloxera*, with which it has even been sometimes confounded.